

# Parents awareness toward antibiotics use in upper respiratory tract infection in children in Al-Qassim region, Saudi Arabia

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## ABSTRACT

**Objectives:** This study aimed to evaluate parents' awareness toward antibiotics use in upper respiratory tract infection in children. **Methods:** This cross-sectional study conducted in Al-Qassim using validated and translated questionnaire which was distributed using what's app. over a period of 3 months, extended from May 2018 to July 2018. **Results:** The number of respondents were 405, majority 81% chose physicians as the main source of information about antibiotic use. Forty-four percent of parents agreed that most URTIs are viral in origin and self-limiting without needing antibiotics. However, 19% of parents believed that antibiotics should be given to all children who have a fever. Fifty two percent were aware that inappropriate use of antibiotics reduces antibiotic efficacy and drives bacterial resistance. Sixty percent of participants chose antibiotics as the treatment they anticipated to be recommended. Fever was the dominant symptom among others of URTI, that would make (21.7%) always ask physicians to prescribe antibiotics. Parents who never asked paediatricians to prescribed antibiotics for their children were (36.5%). The attitude and practice of the participants were associated with the number of children they had; parents with five children or more had a lower attitude and practice score. **Conclusion:** this study found that majority of the participant were educated but with poor attitude and practice. Although parents are concerned about the use of over counter antibiotics, often demand it. Considering that parents are unaware of indications and subsequent complications of using over counter antibiotics, they often request mentioned drugs, showing concern nonetheless. the need to understand parents' knowledge, attitude and practice regarding the use of antibiotics for URTIs is required in creating suitable interventional educational programs and raise awareness to avoid futile antibiotic use.

**Keywords:** Antibiotics, bacterial resistance, upper respiratory tract infection

## Introduction

Upper respiratory tract infection (URTI) represent the most common infectious disease among children. A healthy child could develop URTI about 6 to 8 per year. URTI is an acute illness range from a self-limited, mild disease to a life-threatening condition. URTIs are mostly viral in origin. Viral agents like Rhinovirus and Adenovirus. Most commonly happening during cold winter months. It's the leading cause of missed days at

school and unnecessary medical healthcare which require a great cost on both society and healthcare facilities.<sup>[1]</sup> Majority of URTI patient are evaluated in outpatient settings.<sup>[2]</sup> Most cases of URTI only needs reassurance, education and symptomatic treatment.<sup>[3,4]</sup> One common ineffective practice in pediatric setting is prescribing antibiotics for URTI which are mostly viral in origin.<sup>[5-7]</sup> Antibiotic is one of the most commonly prescribed drug for URTI in primary health care clinics.<sup>[8-10]</sup> The American Academy of Pediatrics released three basic principles for effective use of antibiotic in treating pediatric URTIs. These are accurate diagnosis, consideration of risk versus benefits, and recognize

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when antibiotics are contraindicated.<sup>[11]</sup> The over counter drugs and inappropriate use of antibiotics to treat URTI is increasing and lead to develop an antimicrobial resistance among population and it have been established by many studies.<sup>[12-15]</sup> Physicians and parents are both responsible for the growth of this serious problem.<sup>[16]</sup> Some physician stated that it was according to the parents request even after giving them education.<sup>[17,18]</sup> Parents are concerned of over counter use of antibiotics but they often request it.<sup>[18]</sup> Parents are not fully aware of the indication and complication of using over counter antibiotics. A study was done in Saudi Arabia 2016, to assess parents' KAP regarding the use of antibiotics in URTI in children have showed that most of participant had poor knowledge that led to inappropriate attitude and practice.<sup>[19]</sup> Therefore, the need to understand parents' knowledge, attitude and practice regarding the use of antibiotics for URTIs is required to make right interventional educational programs and raise the awareness to avoid unnecessary use of antibiotics.

### Study design

A cross-sectional study involving 400 subjects was carried out at Al-Qassim over 3 months' duration from May 2018 to July 2018.

### Study population

This study population included the parents of children who responded to the online questionnaire.

### Study setting

The questionnaire was distributed online among Saudi parents on WhatsApp to target population from different regions of Al-Al-Qassim.

### Sample size

The proportion of a target population with definite characteristics is 0.05, Z statistics is 1.96, and we need the reliability at 0.05 level, then the sample size is 384 using  $n = z^2pq/d^2$ . The calculated sample size was 377 to guarantee the accuracy; the sample size was raised to 400 to prevent any lost data or non reply rate.

### Data extraction

A validated and translated questionnaire has been obtained from a study conducted in Riyadh -Saudi Arabia,<sup>[19]</sup> which was obtained from a study done in Greece and Palestinian.<sup>[2,3]</sup>

The questionnaire included four main compartments. The first part, the parents' demographics data such as age, gender, educational level, family income, the region of residency in Qassim province, and number of children in the family was assessed. The second part, the parents' knowledge about antibiotics and URTI has been assessed in seven questions. Moreover, it assessed some beliefs about the use of antibiotics in URTI and the outcome of the inappropriate use of antibiotics. Third part, the parents' attitude about their behavior toward antibiotics in URTI was assessed in ten questions. At the end, there are six questions that assessed the parents' practice regarding antibiotic use.

Most knowledge attitude and practice questions were according to the 5 Likert 5-point scale questions; "strongly agree," "agree," "neutral," "disagree," and "strongly disagree" were the answer options. There are four questions included for the practice of using antibiotics, and the scale of 1 = Always to 5 = Never has been used. The total Knowledge, Attitude and Practice (KAP) scores were calculated by summing up the Likert-scale responses for each category.

### Statistical analysis plan

All values were analyzed using the software Statistical Package of Social Science (SPSS20for windows analysis version). In addition,  $\chi^2$  tests were used for categorical variables and t test for continuous variables;  $P < 0.05$  is a value of statistically significant.

### Ethical considerations

- Obtaining official approval from the ethical committee and responsible authorities was done
- Obtaining permission from the owner of the copyrights of the scaled questionnaire that was used was done
- The objective of the study was explained to the participants with stressing on the importance of the data and its confidentiality
- No obligation to participate
- The data collectors took the participants' agreement consent to participate in the study before starting the questionnaire.

### Data management and confidentiality

Data were classified at first, then were coded within the excel sheet database using a distinctive ID number. The data were kept on a password-protected device with Principle investigator and corresponding investigator, and all data were maintained confidentially. Only the research team can have access to the database for the analyses purpose. The publication will only present summary statistics and no identifying information is used. The name that is used for determining the current health status is kept in a separate database, so it cannot be linked with any medical data.

## Results

Our study included 405 respondents, the majority of the participants were 269 (66.4%) female. Table 1 demonstrates the socio-demographic data of the parents. The respondents' age ranged between 31 and 40 years with a total of 174 (43.0), and most of them had one or two children (42%). Regarding education, nearly all mothers had a bachelor degree 273 (67.4), whereas 244 (60.2%) fathers had a bachelor degree. In relation to the income level of participants, more than 70% of them were in the middle-income level as 291 (71.9%). In total, 50% of the participants were living in Buraydah, 16.8% were living in Al-Rass, 12.3% were living in Unaizah, 09.6% were living in Al-Badaya, and 10.6% were living in other nearby areas.

### Knowledge

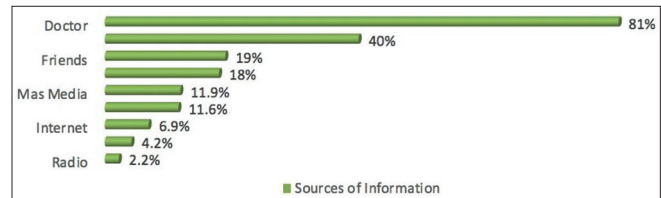
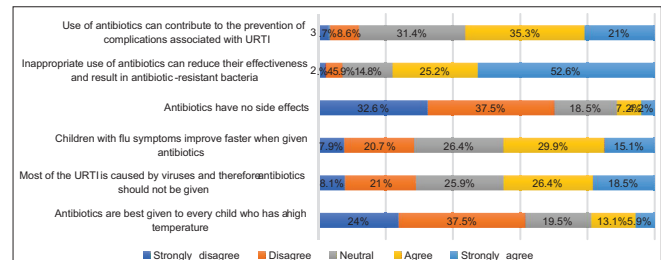
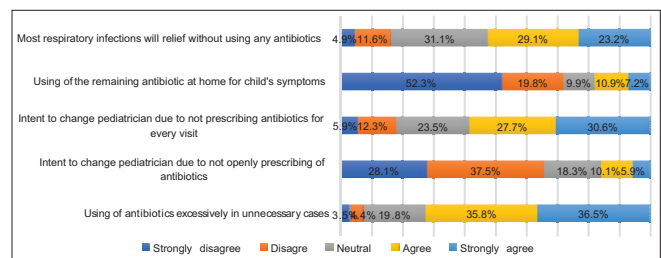
The physicians have been chosen as the as the major source of information about antibiotics, followed by pharmacist (40%),

**Table 1: Descriptive analysis for socio-demographic variables**

Study variables	n (%) (n=405)
Gender	
Male	136 (33.6%)
Female	269 (66.4%)
Age group in years	
18-30 years old	114 (28.1%)
31-40 years old	174 (43.0%)
>40 years old	117 (28.9%)
Educational level of the mother	
Elementary school	25 (06.2%)
Intermediate school	24 (05.9%)
High school	56 (13.8%)
Bachelor degree	273 (67.4%)
Master degree	27 (06.7%)
Educational level of father	
Elementary school	15 (03.7%)
Intermediate school	27 (06.7%)
High school	90 (22.2%)
Bachelor degree	244 (60.2%)
Master degree	29 (07.2%)
Income level	
Poor	07 (01.7%)
Low	13 (03.2%)
Middle	291 (71.9%)
Upper	88 (21.7%)
High	06 (01.5%)
Resident place	
Al-Badaya	39 (09.6%)
Unaizah	50 (12.3%)
Al-Rass	68 (16.8%)
Buraydah	205 (50.6%)
Others	43 (10.6%)
Number of children below 14 years old	
1-3 children	219 (54.1%)
3-4 children	149 (36.8%)
>4 children	37 (09.1%)
Mean±standard deviation	02.6±01.4
How many days will you wait without visiting a pediatrician when a child has one of these symptoms (e.g., a cough, fever, and sore throat)	
1-2 days	224 (55.3%)
3-4 days	136 (33.6%)
>4 days	45 (11.1%)
Mean±standard deviation	02.5±01.7

friends (19%), relatives (18%), (11 %) percent of them were both mass media and TV, six percent of them on the internet, four percent as social media and only two percent of them chooses radio. Figure 1 displays the sources of information which parents turned to.

A 44.9% of respondents agreed that viral infection is the leading cause of URTI, and it is self-limited without antibiotic treatment. However, 19% of parents believed that any child with a fever should be given antibiotics. Moreover, 29.9% expect that antibiotics will fasten the time of recovery from flu symptoms.

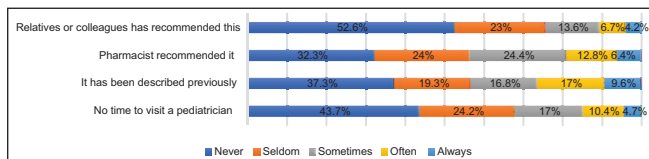

**Figure 1: Distribution of sources of information about antibiotic**

**Figure 2: Knowledge of parents toward antibiotic use in URTI**

**Figure 3: Attitude of parents toward antibiotic use in URTI**

Almost half of the parents (52.6%) agreed that unnecessary and improper use of antibiotics could decrease antibiotic efficacy and raise bacterial resistance. In addition, the possibility of having side effect from antibiotics consumption was known to more than half of the parents. The parents' answers to the questions about knowledge are shown in Figure 2.

## Attitude and expectations

Two days has been chosen by most parents as the duration when they would visit the doctors after their children develops URTI symptoms with a mean duration of  $2.5 \pm 1.7$  days. The majority of parents (73.3%) expected antipyretics and analgesics as the possible treatment to be given by the doctors for URTI in their children. Furthermore, 60.2% of parents chose antibiotics too as the expected treatment when they visit their children doctor. Fever (80.7%) and ear pain (60%) were the most worrisome symptoms for parents if their children developed URTI symptoms. Among the symptoms of URTI, fever was the main symptoms making parents (21.7%) invariably requesting antibiotics from the pediatrician.

Figure 3 shows the parents' attitude toward antibiotic use in URTIs. Most respondents (72.3%) have understood that antibiotics were overly and unreasonably used. Furthermore, 58.3% of parents were going to look for other pediatrician if he is always prescribing antibiotics at each visit.



**Figure 4:** The reasons for parents to give their children antibiotics without consulting a pediatrician

Figure 4 shows different circumstances in which parents could give their children an antibiotic without a pediatrician visit or advice. A 26.6% of parents would use the same antibiotics previously prescribed for the same symptoms in their children, whereas 19.2% would follow the community pharmacists' recommendation to use antibiotics.

## Practice

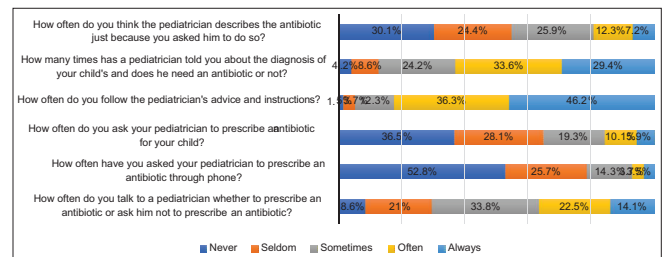
Approximately, 63% of parents were satisfied with their pediatricians because they give enough information about their children's diagnosis and management plan; half of them (52.8%) mentioned that their pediatricians never suggest antibiotics across the phone. A 36.5% of parents never asked the pediatricians to prescribe an antibiotic for their children. In addition, 46.2% of parents stated that they strictly follow their pediatrician's instructions and recommendation. Figure 5 shows the parents response regarding their practice toward antibiotic use in URTI.

Mothers had a better attitude score ( $3.6 \pm 0.7$ ) compared to fathers ( $3.5 \pm 0.8$ ;  $P = 0.349$ ). Moreover, knowledge and practice had some differences in term of gender. Older parents, over the age of 40 years and the younger age groups of 18–30 years show no difference in attitude score ( $3.6 \pm 0.7$ ;  $P = 0.976$ ). There was an association between attitude and practice in relation to number of children, as parents with more than five children had a lower attitude score of  $3.4 \pm 0.6$  ( $p = 0.235$ ) and a lower practice score of  $3.6 \pm 0.5$  ( $p = 0.163$ ) than in parents with less than five children.

Parents level of education have an effect on their KAP; parents with an education level above high school degree had notably higher levels of KAP, as demonstrated in Table 2. In addition, parents from Unaizah city had a higher level of KAP than parents from other regions. The higher income parents show greater knowledge than parents with lower income. Table 2 represents the mean KAP score with the socio-demographic background of the parents.

## Discussion

The study was conducted in Al-Qassim region in Saudi Arabia. The Qassim region is located in the northern part of the Kingdom of Saudi Arabia (KSA). It covers an area of about 73,000<sup>2</sup> km and represents about 3.2% of the total area of the Kingdom. The estimated population of the Qassim region is more than one million; of whom, 80.4% are Saudis and 19.6% are non-Saudis. Buraidah is the capital of Al-Qassim region with a population of 845505 and about 50% of the total population of the region.<sup>[20]</sup>



**Figure 5:** Practices of parents toward antibiotic use in URTI

This study surveyed parents to evaluate their knowledge, attitude, and practice toward antibiotic use for their children in cases of URTI in form of online distributed questionnaires. To date, there have been few studies addressing parents' knowledge attitudes and practice toward antibiotic use in URTI for children in Saudi Arabia. The current study is comparable with a prior study conducted in the KSA, where the questionnaire obtained was also developed according to a study done in Greece and Palestine.<sup>[4,19,21]</sup>

Alrafiaah's *et al.* study included 385 and Elbur included 400 respondents comparable to our slightly higher findings of 405 participants.<sup>[19,22]</sup> Initially, this survey reports that the vast majority responding to the questionnaire were mothers same as the study conducted in Saudi Arabia and Palestine.<sup>[19,21]</sup> This is likely because most of the children taken care of by their mothers. Given that the majority of respondents of both genders educational levels was a college degree. Oppositely, Greece study demonstrates that parents with low educational level are the most respondents.<sup>[4]</sup> These differences are not surprising, given the different way in which the surveys were distributed.<sup>[4,19]</sup> Most participants were living in Buraydah, as it is the region with highest number of citizens in Qassim.

As regard the knowledge, it is worth mentioning that most parents chose doctors as the fundamental source of information concerning the use of antibiotics, which highlights the amount of confidence and trust the parents' place in their relationship with their physician. In addition, this relationship should be considered to facilitate further medical advice, and information for parents regarding the medical management of their children being that parents will actively follow the physicians' advice. Our study exhibited 63% of participating parents were satisfied with their physician because they provided sufficient information about the diagnosis and management plan of their child compatible with a study among Greek parents that presented how parents and doctors have a trustful relationship as a result of them being satisfied with the knowledge provided and that they would not change their personal pediatricians if antibiotics were misused, whereas few parents will look for treatment from other pediatricians if antibiotics were not prescribed. Furthermore, 80% of Greek parent understand that URTIs are self-limited.<sup>[4]</sup> A study conducted in Palestine shows almost 38% of parents' stated that they did not ask their pediatricians to prescribe antibiotics and only 6% support their pediatricians to



**Table 2: Correlation between socio-demographic characteristics and score of knowledge, attitude, and practices toward antibiotic use in URTI (n=405)**

Factor	Average knowledge score (out of 5)	Average attitude score (out of 5)	Average practice score (out of 5)
Gender			
Male	03.4±0.6	03.5±0.8	03.6±0.6
Female	03.3±0.6	03.6±0.7	03.8±0.6
P	0.605	0.349	0.006 **
Age group in years			
18-30 years old	03.4±0.6	03.6±0.8	03.7±0.6
31-40 years old	03.3±0.6	03.6±0.7	03.8±0.6
>40 years old	03.3±0.5	03.6±0.7	03.7±0.6
P	0.611	0.976	0.333
Educational level of mother			
Elementary school	03.3±0.5	03.1±0.9	03.4±0.6
Intermediate school	03.0±0.6	03.2±0.8	03.4±0.7
High school	03.3±0.6	03.5±0.8	03.7±0.7
Bachelor degree	03.4±0.6	03.7±0.6	03.8±0.6
Master degree	03.6±0.6	03.8±0.7	03.9±0.4
P	0.008 **	<0.001 **	<0.001**
Educational level of father			
Elementary school	03.4±0.7	03.5±0.9	03.7±0.7
Intermediate school	03.2±0.6	03.3±0.8	03.6±0.7
High school	03.2±0.6	03.4±0.8	03.6±0.6
Bachelor degree	03.4±0.5	03.6±0.6	03.8±0.6
Master degree	03.4±0.6	04.0±0.6	04.1±0.4
P	0.028**	0.001**	0.006**
Income level			
Poor	03.0±0.4	03.1±0.9	03.9±0.7
Low	03.2±0.6	03.5±0.7	03.6±0.5
Middle	03.3±0.5	03.6±0.7	03.7±0.6
Upper	03.5±0.5	03.7±0.7	03.9±0.5
High	03.4±0.6	03.0±0.8	03.6±0.7
P	0.112	0.031**	0.165
Resident place			
Al-Badaya	03.4±0.5	03.7±0.6	03.6±0.6
Unaizah	03.4±0.6	03.8±0.8	03.9±0.7
Al-Rass	03.3±0.5	03.6±0.7	03.8±0.5
Buraydah	03.3±0.6	03.5±0.7	03.7±0.6
Others	03.4±0.7	03.6±0.6	03.7±0.6
P	0.782	0.135	0.159
Number of children below 14 years old			
1-3 children	03.4±0.6	03.6±0.7	03.7±0.6
3-4 children	03.3±0.5	03.6±0.7	03.8±0.6
>4 children	03.3±0.6	03.4±0.6	03.6±0.5
P	0.341	0.235	0.163

\*Results are expressed as the mean±standard deviation. URTI - Upper respiratory tract infection. \*P has been calculated using independent-test and one-way ANOVA. \*\*Significant at P≤0.05

not prescribe antibiotics.<sup>[21]</sup> While our result showed that 52.5% of parents never asked for antibiotics, and only 14% asked for not prescribing antibiotics. Parents are acknowledging that URTI are predominantly caused by viruses, and it is a self-limited condition not necessitating antibiotics estimated 44.9%, which is consistent to the findings of Alrafiah and a Greek study with 55% and 80%, respectively.<sup>[4,19]</sup> This is reflected as a favorable attitude hopefully influencing parents not pursuing antibiotics as the main therapy in URTI, thus, decreasing the high counts of microbial resistance encountered. A substantial correlation was found between the number of children and their parents' attitude and

practice regarding antibiotic use in URTI. Parents with a greater number of children had a lower attitude and practice score which is attributed to the accumulated knowledge and experience of the parent from previous off-springs compelling them to disregard the pursuit of a medical physician's consultation. Almost 19% of parents believed every child with fever required to use antibiotics, coherent with Alrafiah findings of 27.3% and Elbur with 80%<sup>[19,22]</sup> possibly explained by the parents' apprehension of the dire consequences of fever and deficient knowledge. Furthermore, specifying fever 80.7% and earache 60% as the most worrisome symptoms entailing a pediatricians' visit in

accordance of other studies which also stated fever 80.8%,<sup>[22]</sup> 81%,<sup>[19]</sup> and earache 49.4%.<sup>[22]</sup> In the current study, more than half (52.6%) of participating parents appreciated that improper use of antibiotics prompt diminished efficacy of antibiotics and increase bacterial resistance and (70.1%) conceded that antibiotics have side effects. Adversely, to a study conducted in Taif city that presented 21% were oblivious that misusing antibiotics minimized antibiotic efficacy and raised resistance.<sup>[22]</sup> Most facts regarding them is use of antibiotics and bacterial resistant were delivered to Saudi and Greek parents through their doctors; however, in United Kingdom, the media was the main source of information regarding antibiotic use and risk of resistance.<sup>[23]</sup>

Most parents mention that more education is required for parents and doctors for proper use of antibiotics.<sup>[24]</sup>

Recently, the Saudi ministry of health aims to decrease the bacterial resistant in the region by improving the policy that prohibits community pharmacies from prescribing any antibiotics without an official physician prescription.

Some limitation should be considered in this study when interpreting is that females were more respondent than males.

Our finding showed that parents in Qassim region were educated, but lacks the accurate knowledge, attitude, and practice about URTI and antibiotics. According to that, educational program targeting both the physician and the general population is a priority to minimize the misuse of antibiotics. Medical institution should provide the physician and pharmacist with updated knowledge and communication skills to get with the level of patient and understand his/her concerns and fear and reassure them. Interventional programs and campaigns are necessary to raise awareness regarding antibiotics use. In addition, taking advantage of easy communication using social media to post only the important knowledge and accurate practice. The physician should understand their important role in the family's health choices and guide them with updated research, and thus, improve and limit antibiotic resistant as much as we can.

In conclusion, this study demonstrates that majority of the parents were educated, however, there are many areas in parental knowledge about using antibiotic in URTIs for their children consider lacking that could lead to inappropriate attitude and practice. The factors responsible for inappropriate attitude and practice were the parenteral self-prescribing tendency, asking, and seeking a doctor who is prescribing antibiotic.

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## Ethical approval

Obtained.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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